

Claims

We claim:

5 1. A method of making a composite metal powder comprising:

(a) combining particles of tungsten or molybdenum metal
with particles of silver oxide or copper oxide in an aqueous
hydroxide solution;

10 (b) heating the solution to a temperature and for a time
sufficient to convert the silver oxide or copper oxide particles
to silver or copper metal particles, said silver or copper metal
particles being substantially adhered to the tungsten or
15 molybdenum metal particles.

2. The method of claim 1 wherein the hydroxide solution has a
hydroxide concentration from 1 to 14 M.

20 3. The method of claim 1 wherein the solution is heated to a
temperature from about 60°C to about 95°C.

4. The method of claim 1 wherein the hydroxide solution is
formed with ammonium hydroxide or sodium hydroxide.

25 5. The method of claim 3 wherein the hydroxide solution is an
aqueous ammonium hydroxide solution.

30 6. The method of claim 5 wherein the aqueous ammonium
hydroxide solution contains 10 to 90 percent water and 90 to 10
percent 14.5 M ammonium hydroxide by volume.

7. The method of claim 5 wherein the aqueous ammonium hydroxide solution has a concentration of about 7 M ammonium hydroxide.

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8. The method of claim 5 wherein the solution is heated for about 10 minutes to about 5 hours.

9. The method of claim 8 wherein the aqueous ammonium hydroxide solution contains 10 to 90 percent water and 90 to 10 percent 14.5 M ammonium hydroxide by volume.

10. The method of claim 1 wherein the composite metal powder has a silver or copper content of from 2 percent to 60 percent by weight.

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11. A method of making a composite metal powder comprising:

(a) combining particles of tungsten or molybdenum metal with particles of Ag_2O or Cu_2O in an aqueous hydroxide solution;

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(b) heating the solution to a temperature of from about 60°C to about 95°C for a time sufficient to convert the Ag_2O or Cu_2O particles to silver or copper metal particles, said silver or copper metal particles being substantially adhered to the tungsten or molybdenum metal particles.

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12. The method of claim 11 wherein the aqueous hydroxide solution is formed with ammonium hydroxide or sodium hydroxide.

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13. The method of claim 11 wherein the hydroxide solution has a hydroxide concentration from 1 to 14 M.

14. The method of claim 11 wherein the hydroxide solution is aqueous ammonium hydroxide.

15. The method of claim 14 wherein the aqueous ammonium hydroxide solution contains 10 to 90 percent water and 90 to 10 percent 14.5 M ammonium hydroxide by volume.

16. The method of claim 14 wherein the aqueous ammonium hydroxide solution has a concentration of about 7 M ammonium hydroxide.

15. The method of claim 14 wherein the solution is heated for about 10 minutes to about 5 hours.

16. The method of claim 15 wherein the aqueous ammonium hydroxide solution has a concentration of about 7 M ammonium hydroxide.

17. The method of claim 11 wherein tungsten or molybdenum metal particles have a FSSS size of from about 0.5 μm to about 30 μm and the Ag_2O or Cu_2O particles have a FSSS size of from about 1 μm to about 6 μm .

18. The method of claim 11 wherein the composite metal powder has a silver or copper content of from 2 percent to 60 percent by weight.

19. A method of making a composite metal powder comprising:

(a) combining particles of tungsten or molybdenum metal with particles of Ag_2O or Cu_2O in an aqueous ammonium hydroxide solution, the tungsten or molybdenum metal particles having a
5 FSSS size of from about $0.5\ \mu\text{m}$ to about $30\ \mu\text{m}$ and the Ag_2O or Cu_2O particles having a FSSS size of from about $1\ \mu\text{m}$ to about $6\ \mu\text{m}$;

(b) heating the solution to a temperature of from about
10 60°C to about 95°C for about 10 minutes to about 5 hours to convert the Ag_2O or Cu_2O particles to silver or copper metal particles, said silver or copper metal particles being substantially adhered to the tungsten or molybdenum metal particles and the composite metal powder having a silver or
15 copper content of from 2 percent to 60 percent by weight.

20. The method of claim 19 wherein the aqueous ammonium hydroxide solution has a concentration of about 7 M ammonium hydroxide.

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